

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

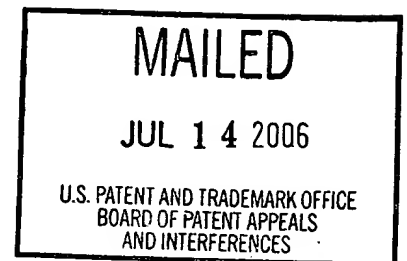
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRUCE M. SCHENA and LOUIS B. ROSENBERG

Appeal No. 2006-1831
Application No. 09/755,383

ON BRIEF



Before KRASS, RUGGIERO and HOMERE, Administrative Patent Judges.

HOMERE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 47 through 68 and 71 through 80, all of which are pending in this application. Claims 1-46, 69 and 70 have been cancelled by Appellants.

We affirm.

Invention

Appellants' invention relates generally to a mouse (12), which is connected to a touchpad sensor (161) in such a way to provide a realistic force feedback to the user while manipulating the mouse (12). The touchpad sensor (161) is configured to detect the position and motion of the mouse (12) in an x-y plane. The touchpad sensor (161) is further configured to detect the degree of force applied to the mouse in the z-direction. Based on the detected position and motion of the mouse (12), as well as the detected degree of force applied to the mouse (12), the touchpad sensor (161) subsequently outputs a feedback signal to an actuator (64a, 64b), which is coupled to the mouse (12) via a linkage (48). Upon receipt of the output feedback signal, the actuator (64a, 64b) generates a haptic feedback signal to the user.

Claim 47 is representative of the claimed invention and is reproduced as follows:

47. A device, comprising:

a touchpad sensor configured to detect a position and motion of an object in an x-y plane, said touchpad sensor further configured to detect a degree of force applied to said touchpad sensor in a z-direction and to output at least one sensor signal, the sensor signal being based on the position of the object, the motion of the object and the detected degree of force;

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at least one actuator coupled to and spaced apart from said touchpad sensor, said actuator configured to receive a feedback signal and generate haptic feedback based on the feedback signal, the feedback signal being associated with the sensor signal; and

a linkage coupling the object and the touchpad sensor.

References

The Examiner relies on the following references:

| | | |
|------------------------------|-----------|--|
| Noll | 3,919,691 | Nov. 11, 1975 |
| Hannaford et al. (Hannaford) | 5,642,469 | Jun. 24, 1997 |
| Zilles et al. (Zilles) | 6,111,577 | Aug. 29, 2000 (filed Apr. 04, 1996) |

Rejections At Issue

A. Claims 47-50, 52, 54, 56-60, 71-73, 75, and 77-80 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Hannaford and Noll.

B. Claims 51, 53, 55, 61-68, 74 and 76 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Hannaford, Noll and Zilles.

Rather than reiterating the arguments of Appellants and the Examiner, the opinion refers to respective details in the Briefs¹

¹ Appellants filed an Appeal Brief on May 09, 2005. Appellants filed a Reply Brief on January 09, 2006.

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and the Examiner's Answer². Only those arguments actually made by Appellants have been considered in this decision. Arguments that Appellants could have made but choose not to make in the Briefs have not been taken into consideration. See 37 CFR 41.37(c)(1)(vii)(eff. Sept. 13, 2004).

OPINION

In reaching our decision in this appeal, we have carefully considered the subject matter on appeal, the Examiner's rejections, the arguments in support of the rejections and the evidence of obviousness relied upon by the Examiner as support for the rejections. We have likewise reviewed and taken into consideration Appellants' arguments set forth in the Briefs along with the Examiner's rationale in support of the rejections and arguments in the rebuttal set forth in the Examiner's Answer. After full consideration of the record before us, we agree with the Examiner that claims 47-50, 52, 54, 56-60, 71-73, 75, and 77-80 are properly rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Hannaford and Noll. We also agree with the Examiner that claims 51, 53, 55, 61-68, 74 and 76 are properly rejected under 35 U.S.C. § 103 as being unpatentable

² The Examiner mailed an Examiner's Answer on November 03, 2005. The Examiner mailed an office communication March 20, 2006, stating that the Reply Brief has been entered and considered.

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over the combination of Hannaford, Noll and Zilles. Accordingly, we affirm the Examiner's rejections of claims 47 through 68 and 71 through 80 for the reasons set forth **infra**.

I. Under 35 U.S.C. § 103, is the Rejection of Claims 47-50, 52, 54, 56-60, 71-73, 75, 77-80 under 35 U.S.C. § 103 as being unpatentable over the combination of Hannaford and Noll Proper?

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of establishing a **prima facie** case of obviousness. **In re Oetiker**, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). **See also In re Piasecki**, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). The Examiner can satisfy this burden by showing that some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art suggests the claimed subject matter. **In re Fine**, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellants. **Oetiker**, 977 F.2d at 1445, 24 USPQ2d at 1444. **See also Piasecki**, 745 F.2d at 1472, 223 USPQ at 788.

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An obviousness analysis commences with a review and consideration of all the pertinent evidence and arguments. "In reviewing the [E]xaminer's decision on appeal, the Board must necessarily weigh all of the evidence and argument." **Oetiker**, 977 F.2d at 1445, 24 USPQ2d at 1444. "[T]he Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion." **In re Lee**, 277 F.3d 1338, 1344, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002).

With respect to the cited claims, Appellants argue in the Appeal Brief and the Reply Brief that Hannaford does not teach a touchpad sensor for detecting the position and motion of an object in an x-y plane, as well as for detecting the degree of force applied to the touchpad sensor in a z-direction to thereby output a signal based on the detected position, motion and degree of force. Particularly, at page 4 of the Appeal Brief, Appellants state the following:

Hannaford et al does not disclose a touchpad sensor. Rather, Hannaford et al discloses a planar assembly 20 which supports an end effector 18 by way of chains 26, 28 and 30 such that the end effector can be moved in the x-y plane. The planar assembly itself is supported by links 68 and 70 to be movable in the z-direction. There is no suggestion in Hannaford et al of the use of a touchpad sensor, or of a linkage coupling the touchpad sensor with an object in the manner of the present invention. Instead, in Hannaford et al, a much more complex and massive arrangement is used,

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none of the components of which can be equated with the touchpad sensor of the present invention, or with the linkage coupling the touchpad sensor with an object. This shortcoming is not remedied by Noll, even if the latter were properly combinable with Hannaford et al., a point which has not been adequately advanced in the rejection of the claims and which is not conceded by Applicants.

In order for us to decide the question of obviousness, "[t]he first inquiry must be into exactly what the claims define." **In re Wilder**, 429 F.2d 447, 450, 166 USPQ 545, 548 (CCPA 1970). "Analysis begins with a key legal question-- what is the invention claimed ?"...Claim interpretation...will normally control the remainder of the decisional process." **Panduit Corp. v. Dennison Mfg.**, 810 F.2d 1561, 1567-68, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987), **cert denied**, 481 U.S. 1052 (1987).

We note that representative claim 47 reads in part as follows:

a touchpad sensor configured to detect a position and motion of an object in an x-y plane, said touchpad sensor further configured to detect a degree of force applied to said touchpad sensor in a z-direction and to output at least one sensor signal, the sensor signal being based on the position of the object, the motion of the object and the detected degree of force.

We note that at paragraphs 101 through 103, Appellants' specification states the following:

[0101] FIG. 4f is a perspective view of another alternate embodiment of a sensing system including a planar sensor 162. Sensor 162 includes a planar sensor or "touch pad"

161 having rectangular sensing area and a pointer 162. Planar sensor 161 is preferably positioned somewhere beneath linkage 40; it is shown approximately at the position of opening 76 in FIG. 4f, but can be provided in other positions as well. Pointer 162 is coupled to bearing 58 at axis D and extends down to contact the tablet 161, and can be a plastic or metal nub, for example. Pointer 162 can also be placed at other bearings or positions of the linkage in other embodiments. The planar sensor 161 can also be placed within opening 76 so that pointer 162 acts as guide pin 78.

[0102] Planar sensor 161 is functional to detect the x and y coordinates of the tip 163 of pointer 162 on the tablet. Thus, as the mouse 12 is moved in its planar workspace, pointer 162 is moved to different locations on planar sensor 161. The x-y position of the local frame 30 on planar sensor 161 is transformed to the host frame 28 and the user controlled graphical object is displayed accordingly.

[0103] In the preferred embodiment, planar sensor 161 can also sense the pressure of tip 163 on the tablet, i.e., in the z-direction. For example, the Versapoint Semiconductive Touch Pad from Interlink is a suitable planar sensor that detects the x-y position as well as pressure or force in the z-direction. The pressure information can be useful in some embodiments for a variety of purposes. A first use is for a safety switch. The pressure information can be used to determine whether the user is currently placing weight on the user object. If the user is not placing weight, then the actuators can be deactivated for safety reasons, as described below with reference to FIG. 7b.

Thus, the claim does require a touchpad sensor for detecting the position and motion of an object in an x-y plane, as well as for detecting the degree of force applied to the touchpad sensor in a z-direction to thereby output a signal based on the detected

position, motion and degree of force.

Now, the question before us is what Hannaford and Noll would have taught to one of ordinary skill in the art? To answer this question, we find the following facts:

1. At column 2, lines 1 through 25, Hannaford states that:

According to the invention, a direct-drive manipulator enables precision manipulation and force display at a control point. By using a pen-like or other end-effector an operator applies forces to the control point. The manipulator responds to the applied forces allowing movement of the control point within a workspace domain over three degrees of freedom. When combined with a controller implementing a control algorithm for a specific application environment, force sensations are reflected back to the control point to be experienced by the operator. Virtual reality, telerobotic, and other simulated, real or remote applications can be created to define a control algorithm. For example, a control algorithm may define immovable object shapes. An operator then is able to trace the virtual object shapes and feel the object boundaries. In another example, a control algorithm may define tissue having shape, texture and force resistance variables at different locations. An operator then may perform a virtual reality surgery, in which the control point is the cutting point of a scalpel. Depending on the position of the control point and force applied, the operator experiences the sensation of cutting through the virtual tissue. In a telerobotic application for remotely controlling a robot, the control algorithm is defined as a reflection of forces encountered by the robot.

2. At column 3, line 64 through column 4, line 6,

Hannaford states that:

Referring to FIG. 2, an operator uses a pen-like or other tool 14 to apply forces/displacements to the control point 12. The manipulator 10 responds to the applied forces allowing control point 12 movement with three degrees of freedom within a workspace 16. The control point 12 is defined at an end-effector 18. The manipulator 10 includes a planar structure 20 enabling motion in an xy plane to define two degrees of freedom. The planar structure 20 is moved along a z-axis by actuators 22, 24 to define a third degree of freedom.

3. At column 1, lines 52 through 63, Hannaford states that:

A force feedback device also is referred to as a force display. In the computer field the term display refers to a visual output device upon which ephemeral images are shown. The display serves as a visual interface between an end user and a computer environment. An operator uses his visual sense to experience the images. Analogously, the term "force display" is coined to refer to an output device upon which ephemeral forces are exhibited. The force display serves as a force-reflective, haptic, kinaesthetic, or tactile interface between an operator and a real or simulated environment. The operator uses his sense of touch to experience the forces.

With the above discussion in mind, we find that the Hannaford reference substantially teaches the claimed invention. Hannaford teaches a pen-like tool for interfacing with a direct drive manipulator, whereby said pen-like tool is able to move and apply a force onto the surface of the direct drive manipulator.

As the pen-like tool interfaces with the direct drive manipulator, a control point stored in the manipulator senses the motion and position of the pen, as well as the degree of force that the pen is applying upon the surface of the manipulator to provide a haptic feedback the operator holding the pen. One of ordinary skill in the art would have duly recognized that Hannaford's teaching of the control point is functionally equivalent to the claimed touchpad sensor, as they both serve the purpose of sensing the position, motion and the degree of force of an object (e.g. a pen or a mouse) as it moves across the surface of a direct drive manipulator or a touchpad. Thus, the ordinarily skilled artisan would have been motivated to use Hannaford's disclosed control point in conjunction with Appellant's mouse to provide a force feedback to the user while operating the mouse.

Appellants also argue that Noll does not teach the touchpad sensor either, and thus, it does not cure the deficiencies of Hannaford. As noted in the discussion above, we find no such deficiencies in Hannaford for Noll to cure. In consequence, we do not find error in the Examiner's position, stating that the

claimed limitation of a touchpad sensor for detecting the position and motion of an object in an x-y plane, as well as for detecting the degree of force applied to the touchpad sensor in a z-direction to thereby output a signal based on the detected position, motion and degree of force would have been obvious over the combination of Hannaford and Noll. It is therefore our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to the ordinarily skilled artisan the invention as set forth in claims 47-50, 52, 54, 56-60, 71-73, 75, 77-80. Accordingly, we will sustain the Examiner's rejection of claims 47-50, 52, 54, 56-60, 71-73, 75, 77-80.

II. Under 35 U.S.C. § 103, is the Rejection of Claims 51, 53, 55, 61-68, 74 and 76 as Being Unpatentable over the combination of Hannaford, Noll and Zilles Proper?

With respect to dependent claims 3 51, 53, 55, 61-68, 74 and 76, Appellants argue at page 5 of the Appeal Brief that the Hannaford and Noll combination does not teach the touchpad

³ We note that Appellants failed to particularly discuss the limitations of these dependent claims in the Briefs. Instead, Appellants rely on their earlier discussion of the limitations of independent claim 47, 60 and 71, which they incorporate by reference in each instance. Consequently, these dependent claims stand or fall with representative claim 47.

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sensor. We have already addressed this argument in the discussion of claim 47 above, and we disagreed with Appellants. Further, Appellants argue that Zilles does not cure the deficiencies of Hannaford and Noll. As noted in the discussion above, we find no such deficiencies in Hannaford and Noll for Zilles to cure. In consequence, we do not find error in the Examiner's position, stating that the claimed limitation of a touchpad sensor for detecting the position and motion of an object in an x-y plane, as well as for detecting the degree of force applied to the touchpad sensor in a z-direction to thereby output a signal based on the detected position, motion and degree of force would have been obvious over the combination of Hannaford, Noll and Zilles. It is therefore our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to the ordinarily skilled artisan the invention as set forth in claims 51, 53, 55, 61-68, 74 and 76. Accordingly, we will sustain the Examiner's rejection of claims 51, 53, 55, 61-68, 74 and 76.

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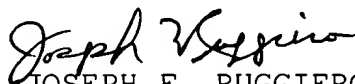
CONCLUSION


In view of the foregoing discussion, we have sustained the Examiner's decision rejecting claims 47 through 68 and 71 through 80 under 35 U.S.C. § 103. Therefore, we affirm.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED


ERROL A. KRASS)
Administrative Patent Judge)


JOSEPH F. RUGGIERO)
Administrative Patent Judge) BOARD OF PATENT


JEAN R. HOMERE)
Administrative Patent Judge) APPEALS AND
INTERFERENCES

JRH/ce

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DAVID B. RITCHIE
THELEN REID & PRIEST LLP
P.O. BOX 640640
SAN JOSE, CA 95164-0640